Amendments to the Claims:

Please amend the claims as indicated in the marked-up version of the listing of claims presented below. This listing of claims replaces all prior versions and listings of claims in the present application.

Listing of Claims

1. (Previously Presented) A method of calibrating a colour monitoring system so as to compensate for non-ideal real camera characteristics, the method comprising:

establishing a camera offset by measuring or calculating the output voltage of the camera when substantially no light falls on any of its sensor elements, hereinafter referred to as establishing the offset;

establishing a point at which a graph of input light intensity against camera output voltage starts to deviate from a substantially linear characteristic, hereinafter referred to as establishing the knee; and

restricting the amount of light incident on all sensor elements of the camera such that the maximum output corresponds to a voltage at, or below, the knee, and lower light intensities are all within the range of linear operation.

2. (Original) The method according to claim 1, wherein the step of establishing of camera offset is carried out on a periodical basis to keep pace with the variations in offset value caused by variation in ambient conditions.

3. (Previously Presented) The method of claim 1, wherein the step of establishing offset is carried out whenever an image capture operation for capturing a desired image to be monitored is to be carried out.

4. (Previously Presented) The method of claim 1, wherein setting a point of zero light intensity is achieved by closing an iris of the camera.

5. (Previously Presented) The method of claim 1, wherein setting a point of zero light intensity is achieved by setting the camera to monitor a black image, or a black part of an image field of the camera.

6. (Previously Presented) The method of claim 1, wherein setting a point of zero light intensity is achieved by extrapolating from measurements obtained from two or more points of known reflectance somewhere in an image field of the camera.

7. (Original) The method of claim 6, wherein one point of known reflectance comprises an integral part of the desired image itself.

8. (Previously Presented) The method of claim 6, wherein one point of known reflectance comprises a white reference tile within the image field.

9. (Previously Presented) The method of claim 1, wherein there is provided a source of maximum light reflectance within the image field by ensuring that a white object is present somewhere in the image field.

10. (Previously Presented) The method of claim 1, wherein restricting the camera to operate within the linear region is achieved by reducing the camera aperture by closing the iris to a predetermined degree such that the output voltage when measuring the source of maximum light intensity corresponds to a camera output voltage at or below the knee.

11. (Original) The method according to claim 10, wherein the iris is restricted so as to give an appropriate camera output voltage which is a proportion of a full scale value.

12. (Previously Presented) The method of claim 10, wherein restriction of the iris is arranged to ensure that a perfect white reflector registers at the top of the linear region and to then scale down to find appropriate values of camera output versus light intensity.

13. (Previously Presented) The method of claim 1, wherein the step of establishing the knee is carried out less frequently than the step of establishing the offset.

14. (Original) The method of claim 13, wherein the step of establishing the knee is carried out before commencing a plurality of print runs each comprising a plurality of image capture operations.

15. (Previously Presented) The method of claim 13, wherein the step of establishing the knee is carried out after completing a plurality of print runs each comprising a plurality of image capture operations.

16. (Withdrawn) A method of compensating for non-uniformity of lighting across a camera field of view when performing an image capture operation to be monitored by the camera, the method comprising:

positioning substantially uncoloured or uniformly surface coloured material of known colour characteristics in a field of view of the camera; and

capturing image data from the camera and storing such captured image data as a "uniformity image" the image data of the uniformity image including information concerning the degree of light reflected from or transmitted by the different spatial areas of the material detected by the camera.

17. (Withdrawn) The method of claim 16, wherein image capture operations of images to be inspected are thereafter carried out and compensation for non-uniform lighting conditions effected for each captured image.

18. (Withdrawn) The method of claim 17, wherein the compensation comprises normalising each newly captured image across the camera field of view by determining spatial adjustment factors from the uniformity image and, where no uniformity image data is available for a particular spatial location, interpolating between the various positions or extrapolating beyond them.

19. (Withdrawn) The method of claim 18, wherein the step of normalising each newly captured image comprises the sub-steps of:

recording output data from the camera averaged over all the pixels in a given spatial area of the sample with the sample at a first, training, position on a printed web to be captured by the camera to give first position camera channel output data C_T; and recording the camera output data from the camera averaged over all the pixels in the same given spatial area of the sample with the sample at a second position on the printed web having different lighting conditions to give second position camera channel output data C_s.

20. (Withdrawn) The method of claim 19, wherein the step of normalizing further comprises normalizing the second position camera channel output data Cs prior to comparing them to the trained values from the first position camera channel output data C_T by processing them in accordance with the following equation: C_s x C_1/C_2, where C_1 is the average channel value for the area of an unprinted web captured by the camera during the image capture operation and corresponding to the first position, and C_2 is the average channel value for the unprinted web corresponding to the second, differently lighted position.

21. (Withdrawn) The method of claim 20, wherein three camera channels R, G and B (red, green, blue) are present.

22. (Withdrawn) The method of claim 21, wherein for the red channel R, the first position camera channel output data is R_T, the second position camera channel output data is R_S, the average red value for the area of an unprinted web corresponding to the starting position is R_1 and the average value of an unprinted web corresponding to the second, differently lighted, position is R_2.

23. (Withdrawn) A method for the capture and analysis of image data of a moving material monitored by a camera having its field of view trained on the material, the method comprising:

storing a pattern recognition model comprising image data corresponding to at least part of a pattern repeat printed on the monitored material;

measuring the displacement of the pattern model in each captured image of the printed web relative to a captured training image to sub-pixel accuracy; and

calculating the colour of the displaced vignette or half-tone area allowing for sub-pixel displacements (both vertical and horizontal).

24. (Withdrawn) A method according to claim 23, wherein subsequent to the step of measuring the displacement and prior to the step of calculating the colour, there are performed the following steps:

on the basis of the measured displacement, calculating a displacement value by which a camera used to capture images of the web is to be moved in a transverse direction relative to the web so as to substantially reduce transverse displacement of the pattern recognition model relative to the captured training image during a subsequent image capture operation; and

moving said camera according to the calculated displacement value; and

carrying out said subsequent image capture operation.

25. (Withdrawn) A method according to claim 24, wherein following said step of carrying out said subsequent image capture operation there is then carried out a further step

comprising measuring the displacement of the pattern model in a the newly captured image of the printed web to sub-pixel accuracy.

26. (Withdrawn) A method according to claim 24, wherein displacements of the pattern model in the longitudinal direction of the web are compensated for by delaying or speeding up a trigger signal fed to the camera, so as to perform an image capture operation relatively earlier or later according to a measured longitudinal displacement of the pattern recognition model relative to the captured training image.

27. (Withdrawn) The method of claim 23, wherein the method further includes the steps of:

monitoring synchronization signals (SYNC) from the camera; and

in accordance with the operating characteristics of the camera, triggering a lighting source during the camera vertical blanking interval so as to illuminate the material during image capture periods.

28. (Withdrawn) The method of claim 23, wherein image capture is arranged to take place at time intervals which can be externally monitored by means of monitoring camera output SYNC signals and illumination of the web is provided at the appropriate moment around image capture and is triggered by the SYNC signals.

29. (Withdrawn) The method of claim 23, wherein image data from the camera is analyzed so as to carry out a pattern recognition operation based upon the pattern recognition model to determine the physical position of the printed pattern repeat on the web in the field of view of the camera at the time of image capture.

30. (Withdrawn) The method of claim 29, wherein following successful pattern recognition, analysis of the image captured to inspect the required areas displaced by the same displacements as the pattern model is carried out with sub-pixel accuracy.